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COPE PROGRAM
PROGRESS REPORT FOR FY 88

COPE Advisory Council Meeting
Hatfield Marine Science Center
Newport, Oregon
10:00 A.M., May 10, 1988

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COPE PROGRAM
PROGRESS REPORT FOR FY 88

COPE Advisory Council Meeting
Hatfield Marine Science Center
Newport, Oregon
10:00 A.M., May 10, 1988

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COPE Program[*]
Progress Report

Table of Contents

Item Page

Meeting Agenda i

COPE Advisory Council Members ii

Cooperating Organizations iv

Minutes of COPE Advisory Council Meeting of November 24, 1987 vi

Progress Reports:

Fundamental COPE Studies 1

Adaptive COPE Technology Transfer Activities 36

New Study Proposals for FY 89

Fundamental Studies 38

Adaptive Studies 51

Budgets for FY 88 and FY 89

Fundamental COPE 63

Adaptive COPE 64

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[*] Compiled by Steve Hobbs (COPE Program Leader) and Cathy Iwai (COPE Secretary), Forestry Sciences Laboratory, 3200 S.W. Jefferson Way, Corvallis, OR 97331. 503/757-4402.

AGENDA

COPE Advisory Council Meeting
Hatfield Marine Science Center
Newport, Oregon
10:00 a.m., May 10, 1988

Time	Topic	Discussion Leader
10:00 a.m.	Welcome and Introductory Remarks ✓	Charlie Philpot
10:10	Brief Status Reports ✓ Fundamental COPE Adaptive COPE	Steve Hobbs
10:20	Basin Committee Report	✓ Gary Lamberti
10:40	Objectives and Evaluation Committee Report	✓ Steve Hobbs
11:00	New Study Proposals	✓ Steve Hobbs
11:30	Budget Proposals for FY 89 Fundamental COPE Adaptive COPE	Steve Hobbs
12:00 p.m.	Discussion	Carl Stoltenberg
12:30	Adjourn	

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COPE COOPERATORS

Federal Agencies

- Bureau of Indian Affairs
- Bureau of Land Management
- Pacific Northwest Research Station
- Siskiyou National Forest
- Siuslaw National Forest
- U.S. Fish and Wildlife Service

State Agencies

- Department of Energy
- Department of Fish and Wildlife
- Department of Forestry
- Department of Land Conservation and Development
- Division of State Lands
- Oregon State University

Oregon Counties

- Benton
- Coos
- Curry
- Douglas
- Josephine
- Lane
- Lincoln
- Polk
- Tillamook
- Yamhill

Forest Industries

- Bohemia, Incorporated
- Boise Cascade Corporation
- Champion International Corporation
- Davidson Industries, Incorporated
- Diamond B Lumber Company
- Georgia-Pacific Corporation
- Giustina Brothers Lumber and Plywood Company
- Howard-Cooper Corporation
- Hydraulic & Machine Services, Incorporated
- International Paper Company
- James River Corporation
- Longview Fibre Company
- McDonald Industries Oregon, Incorporated
- Papé Brothers, Incorporated
- Roseburg Resources Company

Forest Industries (continued)

- Rosoboro Lumber Company
- Ross Corporation
- RSG Forest Products, Incorporated
- Smurfit Newsprint Corporation
- Starker Forests, Inc.
- Stimson Lumber Company
- Sun Studs, Incorporated
- Three-G Lumber Company
- Weyerhaeuser Company
- Willamette Industries, Incorporated
- Willamina Lumber Company

Oregon Coastal Zone Management Association

Oregon Small Woodland Association

Minutes of the COPE Advisory Council Meeting
Hatfield Marine Sciences Center
Newport, Oregon
November 24, 1987

Council members present: Jerry Asher (vice Mel Berg), Mike Beyerle, John Byrne, Don Davis, John Hampton, Bill Harland (vice Craig Hanneman), John Purcell, Jay Rasmussen, Rollie Rousseau, Harold Sawyer (vice Fred Hansen), Barte Starker, Tom Thompson, Bill Vian, Einar Wold.

Others present: Bill Atkinson, Cathie Bacon, Emily Barlow (for Senator Packwood), George Bengtson, Don Boelter, Jim Boyle, George Brown, Bob Ethington, Hank Froehlich, Dave Garber, Andy Hansen, Steve Hobbs, Bill McComb, Tom McMahon, Logan Norris, Chris Pierce (for Congressman AuCoin), Bill Rogers, Jim Rombach, Arne Skaugset, Carl Stoltenberg, Fred Swanson, Lavern Weber, John Zasada.

Bob Ethington opened the meeting by welcoming members of the Advisory Council and other participants. This was followed by a round of self-introductions. Bob then asked for comments on the minutes to the May 12, 1987 Advisory Council meeting. There were no changes and the minutes were unanimously approved by the Council.

An overview of the status of fundamental studies currently underway was presented by Steve Hobbs. All projects are essentially on schedule although several have experienced minor delays because of poor weather conditions or personnel changes. Steve then introduced several of the fundamental COPE scientists who provided the Council with a more detailed update on their individual studies. Fred Swanson and Hank Froehlich reviewed the status of the study on Headwall/Landslide-Prone Areas. In this study the effectiveness of headwall leave areas and an evaluation of Forest Service and BLM headwall stability rating systems are being examined. Fred Swanson told the Council that the effectiveness of headwall leave areas remains unclear because a storm event of sufficient magnitude to really test the system has not occurred. Hank Froehlich mentioned that in his inventory work of landslides he has found quite a number of slides in relatively undisturbed forest areas. He emphasized the need to quantify the rate of landslide occurrence between managed and unmanaged areas.

John Zasada gave a presentation on his Slash Burning and Planting study. He described the study methodology and reported that five study sites have been planted with four more scheduled for planting this winter. Preliminary results indicate that prescribed burning greatly increases planting productivity.

Following John, Bill McComb reported on the Wildlife in Riparian Zone study. He explained to the Council that because this is a new study, most of the year will be devoted to conducting a detailed problem analysis and testing different sampling methods to identify which methods are most suitable for Coast Range conditions. Eventually he will conduct manipulative experiments to explore the effects of harvesting or various management strategies on wildlife populations in key basins where other COPE-related research will be conducted. In this regard, Steve Hobbs indicated that he plans to assemble a committee to identify three key basins for study in the Coast Range. He also told the Council that he is forming another committee to examine program objectives more closely and to develop a system for program evaluation. Both committee reports should be ready in time for the spring Advisory Council meeting. John Hampton suggested that wildlife/riparian zone studies should focus on controversial species. Bill concurred with this point and indicated that his research will try to identify critical species sensitive to silvicultural or harvesting prescriptions.

Steve Hobbs introduced the Adaptive COPE staff: Cathie Bacon, silviculturist; Andy Hansen, wildlife habitat scientist; Tom McMahon, fish habitat scientist; and Arne Skaugset, soil scientist/hydrologist. He then discussed the FY 1988 objectives for the Adaptive Team. These will focus primarily on technology transfer activities such as publishing a quarterly newsletter, conducting workshops, and becoming acquainted with local managers and resource specialists. John Hampton asked if members of the Adaptive Team would be available to speak before various community groups. Carl Stoltenberg indicated that they would and that it would be helpful if Council members identify key people and organizations for them.

Carl Stoltenberg told the Council that FY 88 funding for the Adaptive Program was at 91 percent of the goal of $350,000. Commitments from the Bureau of Land Management, Forest Service and industry were on track at 100 percent. State Forests and the counties were respectively at 57 and 90 percent of their commitments. All other groups were at 63 percent. Carl said that the diversity of funding sources and wide-spread support have helped to secure funding for the fundamental portion of the program. George Brown commented that although several major environmental groups have been asked to join other cooperators and provide funds to Adaptive COPE, no responses have been received.

Carl's presentation was followed by a general discussion. John Hampton said that landowners do not feel that the new State regulations, relative to harvesting conifers in riparian zones, are well founded and that COPE should work with State Forestry to see if the rules are effective. Barte Starker seconded John Hampton's comments. Steve Hobbs indicated that his impression after discussions with State Forestry personnel, is that they are also concerned about this and are taking the monitoring program very seriously. He suggested that a good way of addressing this issue is to conduct manipulative experiments in and adjacent to riparian zones. Bill Vian suggested that because vegetation recovers so quickly following disturbance in the Coast Range, that perhaps brush and deciduous hardwoods might provide adequate stream protection and that it might be worthwhile to investigate this approach.

Steve Hobbs suggested that the spring Advisory Council meeting be set for sometime in mid-May. He reminded the Council that this meeting is usually devoted to planning and budgets for the next fiscal year.

In his closing comments Bob Ethington told the Council that he would step down from his current position as Director of the PNW Station in December and retire from the Forest Service to become Department Head of the Department of Forest Products at Oregon State University.

The meeting adjourned at 12:15 p.m.

STEPHEN D. HOBBS
COPE Program Leader

LIST OF PROGRESS REPORTS

Page

I. Riparian Zone Management

A. Evaluating the Socio-Economic Ramifications of alternative forest Resource Management Options in Coastal Oregon (Doug Brodie, OSU; Con Schallau, PNW) 3

B. Ecology and Management of Riparian Vegetation (Dave Paine and John Tappeiner, OSU; Tom Spies and Jim Sedell, PNW) 5

C. Fish Habitat and Riparian Zone Interactions (Stan Gregory, Bob Beschta and Gary Lamberti, OSU; Fred Everest, Gordon Reeves, Jim Sedell, and Fred Swanson, PNW) 8

D. Forest Management on Landslide-Prone Sites: Stability Evaluation, Effectiveness of Leave Areas, Effects of Slides on Riparian and Fisheries Resources (Hank Froehlich, and Charles Andrus, OSU; Fred Swanson, PNW) 12

E. Cost of Producing Additional Non-Timber Outputs From Riparian Zones (Doug Brodie, OSU) 15

F. Wildlife Habitat and Wildlife Diversity in Riparian Zones: A Gradient Approach (Bill McComb, Bob Anthony, and Chuck Meslow, OSU) 17

II. Regenerating Coastal Forests

A. Prescribed Fire in Pacific Northwest Forests: An Analysis (Jack Walstad and Steve Radosevich, OSU; Dave Sandberg, PNW) 20

B. The Effect of Slash Burning on the Number and Distribution of Planting Spots and Planting Productivity on Sites in the Oregon Coast Range (John Zasada and Bill Stein, PNW; John Tappeiner, OSU) 22

C. Ecology and Management of Shrubs and Hardwoods in Coastal Forests (John Tappeiner and Steve Radosevich, OSU; John Zasada, PNW) 24

Page

D. Characterization of the Thermal Environment for Developing Guidelines to Manage Shrubs and Hardwoods in Coastal Forests (Dave Sandberg and Roger Ottmar, PNW) 27

E. Reducing Air Pollution From Hardwood Conversion Burning in Coastal Oregon (Dave Sandberg and Roger Ottmar, PNW) 29

F. A Diagnostic Tool for Predicting the Effects of Interspecific Competition on Growth and Yield of Douglas-fir (Steve Radosevich and Mike Newton, OSU) 31

G. Environment and the Natural Regeneration of Conifers (Don Minore, PNW) 34

III. Technology Transfer Activities 36

Fundamental COPE
Progress Report

March 1988

1. Title:

Evaluating the Socio-Economic Ramifications of Alternative Forest Resource Management Options in Coastal Oregon

2. Principal Investigator(s) and Organization(s):

Dr. J. Douglas Brodie, Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. Con Schallau, Project Leader, Pacific Northwest Research Station, Corvallis

change in personnel twice
still on track

3. Study Objective(s):

a. To enable the translation of alternative levels of resource outputs into community impacts by permitting the assessment of the implied changes in employment, income, occupational makeup, demographic characteristics, and county revenues and expenditures.

b. To integrate the results of this study with the results of other COPE research, in order to fully assess the implications of management options proposed for coastal Oregon.

4. Potential Benefit or Utility of the Study:

The economy of coastal Oregon is greatly dependent on the fisheries, recreation, and forest industries. In that all of these industries, as well as the general quality of life in coastal Oregon are influenced by decisions related to the management of the forest, it is important that we be able to translate forest management options into impacts upon coastal communities. The improved assessment of nonfinancial benefits and costs will aid in the analysis of managerial options as well as political options (e.g., tax policy, social infra-structures needs, and forest practices regulation).

A comprehensive economic assessment will be made of the Oregon coast, including the development of an integrated model of the regional economy, with case specific analyses of management options proposed within the course of other COPE research. Such a model and the related assessments are crucial if we wish to go beyond the standard assessment of financial merit of management options. By blending the econometric, input-output, and simulation techniques with which the investigators have extensive knowledge, a model can be developed that can translate proposed alternatives into employment, income, occupational and demographic makeup, and county revenues.

5. Research Activities:

a. Accomplishments to Date in FY 88:

None

b. Tasks Yet to be Completed in FY 88:

Create three input-output models of the coastal Oregon economy.

c. Plans for FY 89:

Subdivide the input-output analysis and merge the econometric models and the input-output models into the comprehensive, empirical model of the coastal Oregon economy.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

None

b. Planned for Remainder of FY 88:

Prepare a draft FRL or PNW paper which discusses the coastal economy and references the modeling efforts. Prepare an article for the COPE Report.

c. Planned for FY 89:

Prepare an article for the COPE Report.

3. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	27,000	15,000	42,000
FY 89	28,000	12,000	40,000
FY 90	20,000	5,000	25,000
FY 91	20,000	5,000	25,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 91

Fundamental COPE
Progress Report

March 1988

1. Title:

Ecology and Management of Riparian Zone Vegetation

2. Principal Investigator(s) and Organization(s):

Dr. David Paine, Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. Thomas Spies, Research Forester, Pacific Northwest Research Station, Corvallis
Dr. John Tappeiner, Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. James Sedell, Ecologist, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

a. Using photogrammetric and other remote sensing techniques, conduct an extensive inventory of representative areas within the Coast Range for broad species composition and age class of riparian vegetation.

b. Determine the existing riparian vegetation structure (mosaic) within representative river basins (north, central, south) according to stream size, valley width and gradient.

c. Determine what vegetation will regenerate in a given geomorphic zone along a stream or river.

d. Determine stand dynamics of streamside vegetation among different streamside forests and between different stands along a stream size gradient within a basin.

e. Develop guidelines and techniques for managing the major riparian zone shrub, hardwood, and conifer species of coastal Oregon. (This objective will be coordinated with the Ecology and Management of Shrubs and Hardwoods study and with Adaptive COPE research).

4. Potential Benefit or Utility of the Study:

Currently, the vegetative species composition, structure, stocking, and density are unknown for coastal Oregon riparian zones. A riparian vegetation inventory is fundamental and essential to any study of riparian zones in coastal Oregon. Quick results are necessary in order to select research sites for both extensive and intensive basin and stand level studies. The survey will also be necessary for any economic modeling effects.

5. Research Activities:

a. Accomplishments to Date in FY 88:

The new AP 190 Analytical stereoplotter is in operation.

Twenty miles of the Elk River Basin have been mapped.

Extensive investigation of suitable GIS software packages completed. Final decision on how to integrate AP 190 and GIS has not been made.

b. Tasks Yet to be completed in FY 88:

Complete extensive vegetation mapping of riparian zones within the Elk River Basin, prepare maps and appropriate tabular data.

Complete intensive mapping of specific sites of interest as requested by other COPE teams.

Select central coast river basin and obtain appropriate photography for FY 89 mapping.

c. Plans for FY 89:

Implement a geographic information system to handle data generated by the stereoplotter.

Complete mapping and inventory of central coast river basin (extensive and intensive as required by other teams) and obtain photography for the north coast river basin.

Begin on-the-ground detailed survey of riparian zone vegetation in selected basins.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Paine, D., and J. Kiser. 1988. Vegetation mapping and inventory of coastal riparian zoners. COPE Report 1(1):8-9.

Kiser, J., and D. Paine. 1988. A new generation stereoplotter for aerial photo analysis. COPE Report 1(1):10-11.

b. Planned for Remainder of FY 88:

Prepare a draft publication concerning photogrammetric mapping with an analytical stereoplotter.

c. Planned for FY 89:

Prepare an article for the COPE Report.

Submit a manuscript concerning photogrammetric mapping with an analytical steroplotter for publication.

7. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	59,000	40,000	99,000
FY 89	80,000	106,000	186,000
FY 90	88,000	135,000	223,000
FY 91	88,000	135,000	223,000
FY 92	88,000	135,000	223,000
FY 93	88,000	135,000	223,000
FY 94	88,000	110,000	198,000
FY 95	50,000	80,000	130,000
FY 96	50,000	60,000	110,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 96

Fundamental COPE
Progress Report

March 1988

1. Title:

Fish Habitat and Riparian Zone Interactions

2. Principal Investigator(s) and Organization(s):

Dr. Stanley Gregory, Associate Professor, Department of Fish and Wildlife, College of Agricultural Sciences, OSU, Corvallis
Dr. Robert Beschta, Professor, Forest Engineering Department, College of Forestry, OSU, Corvallis
Dr. Fred Everest, Project Leader, Pacific Northwest Research Station, Corvallis
Dr. Gary Lamberti, Assistant Professor, Department of Fish and Wildlife, College of Agricultural Sciences, OSU, Corvallis
Dr. Gordon Reeves, Research Fish Biologist, Pacific Northwest Research Station, Corvallis
Dr. Jim Sedell, Research Ecologist, Pacific Northwest Research Station, Corvallis
Dr. Frederick Swanson, Project Leader, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

To describe relationships between riparian zones and critical fish habitat and to provide a foundation for basin-wide fisheries management.

a. To describe relationships between the distribution and abundance of salmonids and the geomorphic characteristics of basin landforms as a foundation for managing fisheries resources within entire drainage basins.

b. To describe the influence of riparian zone composition and structure on the distribution and abundance of salmonids.

c. To identify management strategies for maintaining riparian characteristics critical for salmonid populations in coastal basins.

d. To evaluate practices for mitigating loss of riparian resources or habitat for fisheries of coastal drainages. (This objective will be developed in future years as a basin context is developed for interpretation.)

4. Potential Benefit or Utility of the Study:

A variety of social, political, and environmental factors are forcing rapid change in management of fish habitat through the management of riparian zones, large woody debris, and instream structures. These management activities are seldom considered in a basin-wide context, a perspective that is essential for successful management of the fishery resource, particularly where mixed ownership patterns prevail.

Results of this study will provide vital data for planning, designing, and implementing management plans for riparian zones and fish habitat. Criteria will be developed for identifying critical areas of fish habitat.

5. Research Activities:

   a. Accomplishments to Date in FY 88:

      Measurements of valley floor landforms, channel morphology, and chanel unit characteristics for selected tributaries of the Elk River Basin have been completed.

      Surveys of fish abundance and distribution for selected tributaries of the Elk River Basin have been completed. These surveys were coordinated with the geomorphic description of the valley floor.

      Numbers of steelhead trout and chinook salmon smolts leaving the Elk River have been determined through outmigrant smolt traps.

      Detailed longitudinal profiles were measured in selected tributaries of the Elk River Basin to provide data for interpreting temperature profiles throughout the drainage.

      Summaries of basin characteristics (geology, vegetation, land use, ownership, fisheries, wildlife) were compiled for the central coast and north coast to provide a basis for selecting watersheds for intensive research.

   b. Tasks Yet to be Completed in FY 88:

      Identify patterns of natural and management related disturbances in the selected basins. (Aerial photo analysis will be a significant component of this work.)

      Analyze field data from the Elk River Basin to establish relationships between valley floor geomorphology and salmonid abundance.

      Summarize Elk River Basin data on fish abundance, channel unit characteristics, and reach type characteristics.

      Develop hypotheses on responses of salmonid populations to valley landforms and riparian zone characteristics in basins of the south coast as a basis for summer field research.

      Test the hypothesized relationships in new study areas of the Elk River and adjacent basins during the summer sampling program.

      Continue smolt trapping in the Elk River (contingent on continued assistance from Oregon Department of Fish and Wildlife).

      Establish another smolt trap in a central coast basin.

Initiate a field survey of fish habitat, fish abundance, and valley floor geomorphology in the Drift Creek watershed of the Alsea River Basin of the central coast. The original Drift Creek Watershed study streams will be included in this survey.

c. Plans for FY 89:

Expand fish, riparian, and geomorphic assessment of the Alsea River Basin.

Continue smolt trap sampling in the south and central coast basins.

Implement riparian management activities for research and demonstration purposes.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Coordination meetings with the Siskiyou National Forest regarding COPE activities in the Elk River Basin.

Presentation of results from Elk River Basin at seminars, workshops, and annual meeting (Department of Forest Sciences seminar, Riparian Assessment Workshop, American Fisheries Society Annual Meeting of the Oregon Chapter, California Licensed Foresters Association Annual Meeting).

b. Planned for Remainder of FY 88:

Present results at workshops, short courses, and field trips as appropriate.

Prepare an article for the COPE Report.

Conduct field trips with resource management agencies and land owners in basins where research activities are anticipated or are underway.

Initiate field demonstrations of riparian management activities designed to enhance fish habitat.

c. Planned for FY 89:

Prepare an article for the COPE Report.

Prepare a draft manuscript based on initial results of ongoing field studies.

Present of research information at seminars, workshops, field trips, etc. as appropriate.

7. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	65,000	55,000	120,000
FY 89	82,000	112,000	194,000
FY 90	110,000	106,000	216,000
FY 91	110,000	106,000	216,000
FY 92	110,000	106,000	216,000
FY 93	110,000	106,000	216,000
FY 94	110,000	106,000	216,000
FY 95	75,000	75,000	150,000
FY 96	50,000	50,000	100,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 96

Fundamental COPE
Progress Report
March 1988

1. Title:

Forest Management on Landslide-Prone Sites: Stability Evaluation, Effectiveness of Leave Areas, and Effects of Landslides on Riparian and Fisheries Resources

2. Principal Investigator(s) and Organization(s):

Dr. Henry Froehlich, Professor, Forest Engineering Department, College of Forestry, OSU, Corvallis
Dr. Frederick Swanson, Project Leader, Pacific Northwest Research Station, Corvallis
Mr. Chip Andrus, Research Assistant, Forest Engineering Department, College of Forestry, OSU, Corvallis

3. Study Objective(s):

a. Compare and evaluate existing approaches to judging the stability of headwalls. If existing approaches prove to be inadequate, develop an improved method of evaluating headwall stability appropriate for field use.

b. Evaluate the role tree roots play in mitigating landslide activity within steep headwalls.

c. Determine where streamside buffer blowdown is likely to occur and if stream sediment levels significantly increase when wide-spread blowdown does occur.

d. Characterize the timing and rate of movement of large scale landslides. Evaluate the effects of forest cutting on movement.

e. Examine variations in precipitation intensity and amounts throughout the Coast Range. Relate rainfall characteristics to landslide activity.

4. Potential Benefit or Utility of the Study:

Evaluation of slope stability in marginally stable areas forms the basis for management decisions on Federal, State, and private land. This research will result in the development of a better system for the evaluation of slide potential after clearcutting.

Also, this study will provide information for managing riparian areas to minimize buffer blowdown and associated stream sedimentation.

5. Research Activities:

a. Accomplishments to Date in FY 88:

Evaluated several slope stability rating models for applicability to headwalls in the central Coast Range.

Began collecting additional field measurements on headwalls in forested and clearcut slopes in the Central Coast Range.

Searched steep areas in the central and northern Coast Range for regions of high landslide susceptibility.

Assisted in restarting network of volunteers measuring precipitation at various locations in the Coast Range.

Continued to monitor two large landslides in the central Coast Range.

b. Tasks yet to be Completed in FY 88:

Collect additional field measurements for headwalls on forested and clearcut slopes in the central Coast Range.

Locate streamside buffer areas appropriate for studying blowdown and accelerated stream sedimentation and begin field measurements.

Establish network of nine recording rain gauges and begin compiling precipitation data from recording gauges and other sources.

Continue monitoring of two large landslides in the central Coast Range.

c. Plans for FY 89:

Following a major storm, revisit part or all of the headwalls on BLM land for which we have detailed field measurements. Determine if recent sliding can be correlated to topography, soil characteristics, vegetation type, and precipitation intensity.

Continue measurements on streamside buffer areas subject to blowdown and accelerated stream sedimentation.

Continue monitoring of large landslides in the central Coast Range.

Continue compiling precipitation data from recording rain gauges and other sources.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Andrus, C., and H. Froehlich. 1988. Unearthing ties between vegetation and landslides. COPE Report 1(1):6-8.

Met with BLM, Forest Service, and State personnel to discuss landslides, headwall rating systems and leave areas for their lands.

b. Planned for Remainder of FY 88:

Prepare an article for the COPE Report.

c. Planned for FY 89:

Prepare an article for the COPE Report.

Participate in seminars, field trips and workshops as appropriate.

7. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	61,000	49,178	110,178
FY 89	72,000	54,000	126,000
FY 90	72,000	48,000	120,000
FY 91	60,000	48,000	108,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 91

Fundamental COPE
Progress Report

March 1988

1. Title:

Cost of Producing Additional Non-Timber Outputs from Riparian Zones

2. Principal Investigator(s) and Organization(s):

Dr. J. Douglas Brodie, Professor, Forest Management Department,
College of Forestry, OSU, Corvallis

3. Study Objective(s):

a. Determine least cost way to increase the production of various non-timber outputs from a range of riparian sites and management options.

b. Compare multiple use policies applied to sites to see if the implied values of non-timber outputs vary widely from site to site.

4. Potential Benefit or Utility of the Study:

Understanding the costs of producing non-timber outputs on a range of sites tells the manager how to increase the non-timber output at no additional cost, through reallocation of the production to lower cost sites. This cost includes both the direct management cost of producing the non-timber output and the opportunity cost of timber values foregone. The costs that managers are willing to incur to produce non-timber outputs should be reasonably stable across sites. If they are not it means that the same level of non-timber output can be produced at lower cost by reallocating the production to lower cost sites. This information can help reduce multiple use conflicts by providing the means to achieve higher levels of non-timber outputs with existing resources or to achieve levels of non-timber outputs without excessive costs in foregone timber production.

5. Research Activities:

a. Accomplishments to Date in FY 88:

None

b. Tasks yet to be Completed in FY 88:

Complete data collection and analysis of case study of selected non-timber outputs on selected sites.

c. Planned for FY 89:

6. Publication and Technology Transfer Activity:

a. Completed to Date in FY 88:

Paredes V., G.L., and J.D. Brodie. 1988. Activity analysis in forest planning. For. Sci. 34(1):3-18.

An additional Paredes and Brodie manuscript is in Journal review.

b. Planned for Remainder of FY 88:

Prepare a draft report describing the theory of estimated values and application to multiple use forest management.

Paredes to complete Ph.D. dissertation. Multiple resource planning: spatial considerations with application to riprarian zones.

Prepare an article for the COPE Report on stand and forest modifications to achieve efficient production of multiple resources.

Develop an applied analysis based on the COPE data base, when data base is available.

c. Planned for FY 89:

Prepare an article for the COPE Report.

7. Estimated Cost:

	OSU
FY 88	30,000
FY 89	16,000
FY 90	16,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 90

Fundamental COPE
Progress Report

March 1988

1. Title:

Wildlife Habitat and Wildlife Diversity in Riparian Zones: A Gradient Approach

2. Principal Investigator(s) and Organization(s):

Dr. William C. McComb, Associate Professor, Department of Forest Science/Department of Fisheries and Wildlife, Oregon State University
Dr. Robert G. Anthony, Assistant Leader, Oregon Cooperative Wildlife Research Unit/Department of Fisheries and Wildlife, Oregon State University
Dr. E. Charles Meslow, Leader, Oregon Cooperative Wildlife Research Unit/Department of Fisheries and Wildlife, Oregon State University

3. Study Objective(s):

a. Determine the relative abundance of vertebrate species and quantify patterns of vertebrate community structure and diversity along transriparian and intrariparian gradients in Coast Range watersheds.

b. Quantify food and cover along transriparian and intrariparian gradients in a representative set of Coast Range watersheds.

c. Assess habitat requirements and the zone of riparian influence for selected species that may be sensitive to riparian zone disturbance.

d. Extensively sample habitat and vertebrate communities at sites throughout the Coast Range that represent a continuum of habitat conditions.

e. Develop and test hypotheses regarding the response of species and communities to changes in vegetation structure and composition within and adjacent to riparian zones.

f. Evaluate opportunities to manipulate vegetation to optimize simultaneous production of wildlife habitat and timber.

4. Potential Benefit or Utility of the Study:

There is currently almost no information which permits objective evaluation of tradeoffs for wildlife management in riparian zones. Controversies over the current Forest Practices Rules makes the need for this information a high priority. The goal of this research is to provide this needed information. Riparian zones receive water, nutrients and energy from upstream sources along the stream gradient, so they are potentially very productive ecosystems. They could add significantly to the food base of a watershed, thereby affecting vertebrate community structure. Variability in food and cover ought to be maximized through time along three spatial gradients: parallel to the stream (increasing floodplain size), perpendicular to the stream (moisture gradient), and vertically from the forest floor to the canopy. Characteristics of the stream and adjacent forest will influence these gradients. Research will be directed to provide information to develop prescriptions at a basin level in coordination with fisheries and forest ecologists working on other COPE projects.

5. Research Activities:

a. Accomplishments to Date in FY 88:

A draft study plan has been prepared.

Preliminary assessments of potential study sites within the Drift Creek Basin have been made.

b. Tasks Yet to be Completed in FY 88:

Combine

Complete a detailed study plan.

Conduct an in-depth problem analysis.

Complete the selection study sites in the Drift Creek Basin on which to conduct a pilot study on the relative abundance, presence or absence, or fitness of vertebrates and their habitat in the Coast Range.

Begin the pilot study on six representative sites in the Drift Creek basin.

c. Plans for FY 89:

Begin three community-level studies in either the Elk or Drift Creek Basin:

1) Avian response to habitat along riparian gradients;

2) Small mammal abundance and diversity along riparian gradients;

3) Habitat use by herpetofauna along riparian gradients.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Poster presented at the North American Wildlife and Natural Resources Conference; "Wildlife Response to Riparian Zones in Moist Forests: A Gradient Approach in Research and management.

McComb, W. C. 1988. Wildlife and riparian zones in Coast Range Forests (submitted to the COPE Report).

b. Planned for Remainder of FY 88:

Prepare a report describing the results of the problem analysis.

c. Planned for FY 89:

Prepare an article for the COPE Report.

7. Estimated Cost:

	OSU
FY 88	65,000
FY 89	91,000
FY 90	120,000
FY 91	120,000
FY 92	120,000
FY 93	100,000
FY 94	100,000
FY 95	60,000
FY 96	60,000

8. Duration of the Study:

Initiation date: FY 88
Scheduled completion date: FY 96

Fundamental COPE
Progress Report
March 1988

1. Title:

Prescribed Fire in Pacific Northwest Forests: An Analysis

2. Principal Investigator(s) and Organization(s):

Dr. John D. Walstad, Professor, Department of Forest Science, College of Forestry, OSU, Corvallis
Dr. Steven Radosevich, Professor, Department of Forest Science, College of Forestry, OSU, Corvallis
Dr. David Sandberg, Project Leader, Pacific Northwest Research Station, Seattle

3. Study Objective(s):

   a. Summarize what is known about fire and prescribed burning in Pacific Northwest forests.

   b. Interpret what it means from the standpoint of:

      1) Significance of available information

      2) Degree of scientific uncertainty and data gaps

      3) Relevancy to current issues

   c. Provide recommendations for decision makers to consider in formulating policies and actions concerning prescribed burning.

4. Potential Benefit or Utility of the Study:

Prescribed burning is a multi-purpose silvicultural practice used throughout the Pacific Northwest. Its importance notwithstanding, this practice is increasingly threatened by regulatory constraints, weather conditions, and health and environmental concerns. The future viability of prescribed burning is predicated upon judicious use of this important forestry practice. An objective analysis of the scientific literature and operational experience concerning prescribed burning would be helpful to decisionmakers faced with silvicultural, regulatory, and legislative issues surrounding this practice.

5. Research Activities:

   a. Accomplishments to Date in FY 88:

   Meeting of authors held at Menucha Conference Center near Portland on November 9-10, 1987.

   Three new chapters were added to the text, and authors designated to prepare them.

b. Tasks Yet to be Completed in FY 88:

Second draft of chapters prepared.

Editorial Board review and peer review completed.

c. Plans for FY 89:

None; developmental work for chapter contents should be completed.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Walstad, J. D. 1988. Prescribed Fire in Pacific Northwest Forests. COPE Report 1(1):9-10.

b. Planned for Remainder of FY 88:

Consolidated report prepared and editing begun for publication.

c. Planned for FY 89:

Manuscript submitted for publication.

Prepare an article for the COPE Report.

7. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	33,000	5,000	38,000
FY 89	18,000	3,000	21,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 89

Fundamental COPE
Progress Report
March 1988

1. Title:

The Effect of Slash Burning on the Number and Distribution of Planting Spots and Planting Productivity on Sites in the Oregon Coast Range

2. Principal Investigator(s) and Organization(s):

Dr. John Zasada, Research Forester, Pacific Northwest Research Station, Corvallis
Dr. John Tappeiner, Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. William Stein, Research Forester, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

a. Provide foresters with a method to quantitatively assess the relationship between fuel loading and planting productivity.

b. Determine the relationship between fuel loading and the density and distribution of planting spots.

4. Potential Benefit or Utility of the Study:

One key objective in burning slash is to increase the number of planting spots, improve the accessibility to the site and increase planting efficiency. Because of weather constraints, air quality concerns, increased cost of burning, and the potential for increased soil erosion and nutrient loss following fire, it is not possible to burn all of the cutovers that would be burned for this specific purpose. A quantitative method is needed to prioritize cutovers for burning based on the relationship between fuel loading, planting spots needed, and planting efficiency.

5. Research Activities:

a. Accomplishments to Date in FY 88:

None

b. Tasks Yet to be Completed in FY 88:

Complete post burning surveys and planting, and survey additional sites if necessary. Continue data analysis.

c. Plans for FY 89:

Complete data analysis. Prepare a manuscript summarizing study results.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Prepared an article for publication in the spring issue of the COPE Report.

b. Planned for Remainder of FY 88:

Presentation will be made at seminars, field trips and workshops as appropriate to inform forest managers and other interested groups of study results.

c. Planned for FY 89:

Submit a manuscript for publication which summarizes study results.

7. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	4,000	30,000	34,000
FY 89	2,000	15,000	17,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 89

Fundamental COPE
Progress Report

March 1988

1. Title:

Ecology and Management of Shrubs and Hardwoods in Coastal Forests

2. Principal Investigator(s) and Organization(s):

Dr. John Tappeiner, Professor, Forest Management Department, College of Forestry, OSU, Corvallis
Dr. John Zasada, Research Forester, Pacific Northwest Research Station, Corvallis
Dr. Steven Radosevich, Professor, Forest Science Department, College of Forestry, OSU, Corvallis

This work will be coordinated with riparian zone studies and with research conducted by Dave Sandberg, PNW.

3. Study Objective(s):

Develop guidelines and techniques for managing the major shrub and hardwood species in the forests of coastal Oregon by:

a. relating their potential rates of vegetative reproduction to the size and vigor of their aerial and/or underground parts;

b. determining the effect of common silvicultural treatments (logging, burning, cutting) on vigor and spatial distribution of vegetation reproduction.

c. determining their rates of reproduction and growth from seed and sprouts in a range of environments common in clearcuts and in young and old-growth stands.

4. Potential Benefit or Utility of the Study:

Currently, foresters manage nonconiferous vegetation in the Coast Range to enhance conifer growth and to provide wildlife habitat. However, they do so with little information on the reproduction and growth habits of shrubs and hardwoods. At what stage of succession do shrubs and hardwoods become established? What environments favor their establishment, and what are their growth rates following reproduction from seed, from vegetative reproduction, and following burning and other silvicultural treatments? How can establishment and growth be predicted? At what age and in what environments do they produce seed? How does interspecific competition affect succession and species composition? With answers to these questions, foresters will be better able to make site-specific prescriptions to produce wildlife habitat and to enhance conifer growth. Zasada and Tappeiner have begun seedling growth and survival studies on salal, bigleaf maple, vine maple, thimbleberry, and elderberry. Tappeiner has completed studies on vegetative and seedling reproduction of tanoak and madrone. Radosevich has begun studies on the seedling establishment and vegetative growth of thimbleberry and salmonberry. Thus collectively, with this research, we will be able to make a substantial step toward answering the questions posed for these major species.

5. Research Activities:

   a. Accomplishments to Date in FY 88:

      Completed sowing of seed germination and seedling growth plots.

   b. Tasks Yet to be Completed in FY 88:

      Monitor germination, survival and vegetative growth rates. Prepare a detailed study plan and begin studies to evaluate effects of fire, cutting, harvesting and site preparation on vegetative reproduction.

   c. Plans for FY 89:

      Monitor seedling survival and growth rates. Continue study of shrub response to management treatments.

6. Publication and Technology Transfer Activities:

   a. Completed to Date in FY 88:

      Prepared manuscript and sumitted to PNW for editorial review (Zasada, J. and J. Tappeiner. Seed viability in bigleaf maple following storage).

   b. Planned for Remainder of FY 88:

      Begin preparation of a manuscript on salmonberry clone structure and growth.

      Prepare a draft manuscript on alder seedling establishment.

      Prepare an article for the COPE Report.

   c. Planned for FY 89:

      Prepare an article for the COPE Report.

7. Estimated Cost:

	OSU	PNW	TOTAL
FY 88	33,000	60,000	93,000
FY 89	45,000	81,000	126,000
FY 90	57,000	75,000	132,000
FY 91	57,000	75,000	132,000
FY 92	35,000	50,000	85,000
FY 93	35,000	50,000	85,000

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: FY 93

Fundamental COPE
Progress Report
March 1988

1. Title:

Characterization of the Thermal Environment for Developing Guidelines to Manage Shrubs and Hardwoods in Coastal Forests

2. Principal Investigator(s) and Organization(s):

Dr. David Sandberg, Project Leader, Pacific Northwest Research Station, Seattle
Dr. Roger Ottmar, Research Forester, Pacific Northwest Research Station, Seattle

The research will be coordinated with John Tappeiner, OSU; John Zasada, PNW; and Steve Radosevich, OSU (Ecology and Management of Shrubs and Hardwoods in Coastal Forests) to describe and model the thermal environment of prescribed fires for assessing the response of several herbaceous and woody species to fire.

3. Study Objective(s):

a. Characterize the humus layer and soil thermal environment (depth of heat penetration, intensity, and duration) from broadcast burns in coastal forests.

b. Develop a thermodynamic heat transfer model based on the relationship between woody fuel load, humus load, live vegetation load, lighting method, fuel moisture, soil moisture, and soil heat transfer properties.

4. Potential Benefit or Utility of the Study:

One of the benefits from prescribed fire is the short-term control of certain plant species which will improve the establishment and survival of tree seedlings. Through the heating of the humus and soil layers by fire, the roots, rhizomes, and buried seeds of unwanted weed species are affected. However, most vegetation succession studies have described the vegetation response without documentation of the fire and the humus and soil thermal environment which created the response.

This study will provide the thermal environment characterization and modeling that is a critical element in development of guidelines for managing the major shrub and hardwood species in the forests of coastal Oregon, the chief objective of the companion study.

The heat intensity, duration, and penetration into the humus and soil layer generated by broadcast burning logging debris is the critical variable determining the overall effectiveness of fire for controlling undesirable vegetation. Modeling the heat transfer process using variables which managers can easily acquire will allow preharvest and prescribed fire planning to best control vegetation and mitigate the effect of fire on air, soil, and water resources.

5. Research Activities:

a. Accomplishments to Date in FY 88:

Analysis of FY 1987 data has been completed. The current study plan has been reassessed and an evaluation of the need for supplemental laboratory research completed. The possibility of adapting an Australian heat transfer model for fire effects has been discussed with the Missoula Fire Lab.

b. Tasks Yet to be Completed in FY 88:

Purchase and adapt 12 additional thermologgers for field implementation. Locate, inventory, burn, and monitor 2-4 units which will include all units set up for the joint study on the Ecology and Management of Shrubs and Hardwoods in Coastal Forests. Discuss the monitoring needs for validation of the Australian heat transfer model.

c. Plans for FY 89:

Analyze FY 1988 data. Purchase and adapt 12 additional thermologgers. Locate, inventory, burn, and monitor 4-6 units.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Regional level training session, Technical Fire Management and 4 Forest level fuel planning sessions.

b. Planned for Remainder of FY 88:

Conduct regional level and forest level training sessions.

Prepare an article for the COPE Report.

c. Planned for FY 89:

Prepare an article for the COPE Report.

7. Estimated Cost:

	PNW
FY 88	50,000
FY 89	51,000
FY 90	50,000
FY 91	50,000
FY 92	50,000

8. Duration of the Study:

Initiation date: FY 87
Scheduled completion date: FY 92

Fundamental COPE
Progress Report
March 1988

1. Title:

Reducing Air Pollution From Hardwood Conversion Burning in Coastal Oregon.

2. Principal Investigator(s) and Organization(s):

Dr. David Sandberg, Project Leader, Pacific Northwest Research Station, Seattle
Dr. Roger Ottmar, Research Forester, Pacific Northwest Research Station, Seattle
Dr. Colin Hardy, Research Forester, Pacific Northwest Research Station, Seattle

3. Study Objective(s):

Explore techniques of slash burning that reduce air pollutant emissions, and develop methods that verify the reduction.

a. Reduce emissions by burning uncured fuels.
b. Reduce emissions through mass ignition.
c. Measure the difference between coniferous and hardwood smoke.
d. Develop inventory techniques for coastal hardwood fuelbeds.

4. Potential Benefit or Utility of the Study:

The productivity of many stands in coastal Oregon is best maintained through the careful application of fire. New burning techniques may increase productivity of the timber resource, better protect the soil, water, and wildlife habitat quality, and improve air quality, without additional cost.

Forest Managers in coastal Oregon may be able to reduce smoke production by over 10,000 tons/year without reducing the area treated by fire if emission reduction techniques prove successful. Coastal burning programs are limited primarily by emission limits improved to protect visual air quality in wilderness and to prevent significant deterioration of air quality in rural areas.

5. Research Activities:

a. Accomplishments to Date in FY 88:

Inventoried two uncured units for wet spring-like burning.

b. Tasks Yet to be Completed FY 88:

Complete field studies for consumption of uncured slash and mass ignition. Develop a mathematical model for curing rate of uncured slash. Study attempts to burn in wetter spring conditions than possible with hand-ignition. Field test a fuel inventory using analytical stereo aerial photography.

c. Plans for FY 89:

Complete analysis and document final results.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Regional training session--Technical Fire Management.

b. Planned for Remainder of FY 88:

Prepare draft manuscripts for publication as research papers or in proceedings.

Regional level and Forest level training sessions.

c. Planned for FY 89:

Prepare an article for the COPE Report.

Submit manuscripts for publication.

7. Estimated Cost:

	PNW
FY 88	30,000
FY 89	46,000

8. Duration of the Study:

Initiation date:	FY 87
Scheduled completion date:	FY 89

Fundamental COPE
Progress Report

March 1988

1. Title:

A Diagnostic Tool for Predicting the Effects of Interspecific Competition on Growth and Yield of Douglas-fir

2. Principal Investigator(s) and Organization(s):

Dr. Steven R. Radosevich, Professor, Department of Forest Science,
Oregon State University
Dr. Michael Newton, Professor, Department of Forest Science,
Oregon State University

3. Study Objective(s):

   a. Develop a biomathematical model capable of simulating the growth of young (3- to 20-year-old) Douglas-fir stands as a function of site factors, tree and stand characteristics, and level of interspecific competition.

   b. Determine threshold levels of interspecific competition with Douglas-fir for each competitor type using the biomathematical model so that appropriate mangement decisions concerning site selection, control practices, and expected returns can be quantified.

4. Potential Benefit or Utility of the Study:

Although many growth and yield simulators have been developed for Douglas-fir, none can be used to characterize stand development in plantations less than 20 years old. Thus, existing growth and yield simulators do not include the effects of early interspecific competition or vegetation management treatments that are applied during this stage of stand development. Vegetation management treatments can have a substantial influence on Douglas-fir stand development and resulting stand attributes.

Restrictions on the predominant tools used for vegetation management (e.g., herbicides) in recent years have increased the need to quantify biological and economic benefits of vegetation management activities. This study will consolidate and synthesize existing research information into a comprehensive form which can assist foresters in assessing the benefits of vegetation management in Douglas-fir plantations. In addition, a framework to evaluate future vegetation management research needs can be created from this effort.

5. Research Activities:

a. Accomplishments to Date in FY 88:

A literature review was conducted to identify (1) factors that influence Douglas-fir survival and growth, and (2) factors and characteristics of major hardwood tree, shrub, and herbaceous species that influence interspecific competition with Douglas-fir.

Based on information extracted from the literature and discussions with forest vegetation experts, a conceptual model was developed that links the growth and development of Douglas-fir and four common competitors: red alder, vine maple, salmonberry, and thimbleberry. Simulation results reveal that the model has the potential to exhibit developmental patterns typically encountered in Coast Range Douglas-fir plantations. The parameters of the model have yet to be validated with empirical data.

b. Tasks Yet to be Completed in FY 88:

The conceptual model will be refined so that it is based on the growth and developed of individual trees in a plantation.

c. Plans for FY 89:

Assemble a database from available sources that can be used to construct a simulation model from the conceptual model. Permission has already been granted to use several data sets in the Oregon State University Forest Science Data Bank.

Construct a simulation model for young Douglas-fir plantations. Empirical data will be used wherever possible to determine model parameters. The output from the model will be formatted so that it is compatible with growth and yield simulators commonly used in the Pacific Northwest.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

Two papers have been written and distributed to members of the CRAFTS Young Stand Model Advisory Sub-Committee. The papers were discussed at the first meeting of the sub-committee held February 11, 1988. One of the papers contains a literature review and the other describes a conceptual model that links the growth of Douglas-fir to four common competitors.

b. Planned for Remainder of FY 88:

Results will be presented at CRAFTS and COPE-sponsored meetings as appropriate. A progress report will be prepared, and articles will be written for the CRAFTS annual report and the COPE Report.

c. Planned for FY 89:

Prepare an article for the COPE Report.

7. Estimated Cost:

	OSU	CRAFTS	Washington DNR	TOTAL
FY 88	36,000	11,000	15,000	62,000
FY 89	40,000	35,000		75,000
FY 90	48,500	39,500		88,000

8. Duration of the Study:

Initiation date: FY 88
Scheduled completion date: FY 90

Fundamental COPE
Progress Report

March 1988

1. Title:

Environment and the Natural Regeneration of Conifers

2. Principal Investigator(s) and Organization(s):

Dr. Don Minore, Research Forester, Pacific Northwest Research Station, Corvallis

3. Study Objective(s):

a. Identify sites and vegetation types in coastal Oregon where planting is not needed to obtain successful conifer regeneration within five years of harvesting when adequate seed sources are present.

b. Identify sites and vegetation types in coastal Oregon where planting is needed to obtain successful conifer regeneration within five years of harvesting regardless of seed source.

c. Define and describe adequate seed sources for obtaining successful natural regeneration in suitable environments.

d. Define and describe the riparian environments that are most suitable for natural forest regeneration.

4. Potential Benefit or Utility of the Study:

High planting costs and the need to preserve locally adapted genotypes make it important to identify coastal environments in which conifers will regenerate naturally. Where natural regeneration occurs promptly and is dependable, large initial investments in artificial regeneration may be unnecessary. Furthermore, by using natural regeneration, the full benefit of natural selection can be realized in terms of matching seed source to site conditions.

Unfortunately, natural regeneration has received little attention in coastal Oregon despite the fact that natural seedlings outnumber planted seedlings on many plantations. It is likely that planting may be unnecessary in some coastal environments if an adequate seed source is present. These favorable environments should be identified and described. However, planting is essential if prompt regeneration is to be obtained in environments unfavorable for natural regeneration. This is particularly important in many riparian environments, where rapid reforestation with minimal soil disturbance is important.

Natural regeneration is impossible without adequate seed sources, but quantitative descriptions of those seed sources are lacking. Parent tree size, number, distribution, and distance needed for successful natural regeneration in coastal Oregon should be measured and described. These measurements and descriptions should be related to the environments in which they occur if they are to be applied in identifying the sites and vegetatio types where planting may be unnecessary.

5. Research Activities:

a. Accomplishments to Date in FY 88:

Draft study plan prepared for review.

b. Tasks Yet to be Completed in FY 88:

Prepare a final study plan.

Begin field measurement and description of sites, seed sources, vegetation, and natural regeneration in coastal Oregon.

c. Plans for FY 89.

Field measurement and description of sites, seed sources, vegetation, and natural regeneration in coastal Oregon.

6. Publication and Technology Transfer Activities:

a. Completed to Date in FY 88:

None.

b. Planned for Remainder of FY 88:

Contact and discuss the study with local silviculturists.

Prepare an article for the COPE Report.

c. Planned for FY 89:

Prepare an article for the COPE Report.

7. Estimated Cost:

	PNW
FY 88	33,000
FY 89	58,000
FY 90	33,000

8. Duration of the Study:

Initiation date:	FY 88
Scheduled completion date:	FY 90

Adaptive COPE
Progress Report

March 1988

1. Title:

Technology Transfer Activities.

2. Principal Investigator(s) and Organization (s):

Adaptive COPE Team, College of Forestry, OSU, Newport.

3. Technology Transfer Accomplishments to date in FY 88:

a. Workshops:

None.

b. Other Activities:

One issue of the COPE Report has been published.

Members of the Adaptive COPE Team have interacted with 25 different groups and organizations.

4. Planned for Remainder of FY 88:

a. Workshops:

One workshop will be conducted at three coastal locations on the subject: "Integrated Resource Management in the Oregon Coast Range."

b. Other Activities:

Publish two more issues of the quarterly newsletter COPE Report.

Assemble a compendium of ongoing research and administrative studies in Coast Range forests by universities, agencies, and industry.

Prepare a 10-year plan for Adaptive COPE.

Continue to establish a close working relationship with coastal resource managers through a series of office and field visits.

Continue to make coastal citizens aware of the COPE Program through the media.

Prepare an annual report.

5. Technology Transfer Plans for FY 89:

a. Workshops:

Conduct three workshops, one on each of the following topics:

1) Management of riparian zones for fish habitat: A silvicultural perpective;

2) Wildlife habitat relations in the wet coniferous forests of the Pacific Northwest; and

3) An overview of slope stability processes and their management implications.

b. Other Activities:

Publish four issues of the quarterly newsletter **COPE Report**.

Prepare an annual Report.

Continue to make coastal citizens aware of the COPE Program through the media and presentations to civic groups.

Continue to establish a close working relationship with coastal resource managers through office visits and field trips.

LIST OF NEW FUNDAMENTAL COPE STUDIES
PROPOSED FOR FY 1989

Page

I. Regeneration of Coastal Forests

A. Second Decade Effects of Site Preparation on Tree and Vegetation Development With and Without Precommercial Thinning (Bill Stein, Pete Owston, and John Zasada, PNW) 39

B. Effects of Time of Manual Cutting on Resprouting of Salmonberry (John Zasada, PNW) 42

C. Species Manipulation as a Strategy to Reduce the Impact of Laminated Root Rot in Regenerated Coastal Stands (Walt Thies, PNW; Alan Kanaskie, Oregon State Department of Forestry) 44

D. Mycorrhizal Inoculation of Bareroot and Container Seedlings Destined for Alder (*Alnus rubra*) Rehabilitation Sites in The Oregon Coast Range (Mike Castellano, and Ralph Crawford, PNW) 47

E. Asymbiotic Nitrogen Fixation in Large Woody Residues of Oregon Coastal Forests (C. Y. Li, Randy Molina, and Ralph Crawford, PNW) 49

April 1988

Study Prospectus - Fundamental COPE

1. Title:

Second decade effects of site preparation on tree and vegetation development with and without precommercial thinning

2. Principle Investigators and Organization:

William I. Stein, Research Forester, Pacific Northwest Research Station, Corvallis, Oregon
Peyton W. Owston, Project Leader, Pacific Northwest Research Station, Corvallis, Oregon
John C. Zasada, Research Forester, Pacific Northwest Research Station, Corvallis, Oregon

3. Applicable COPE Problem:

Regeneration of Coastal Forests

4. Study Objectives:

Determine the extended effects of reforestation practices on the growth of trees and associated vegetation with or without precommercial thinning by:

a. Comparing tree survival and growth during the second decade following different site preparation treatments.

b. Determining changes in vegetative cover, height, and animal use as conifers close crowns with or without precommercial thinning.

c. Quantifying the effects of precommercial thinning on stand growth, vegetative development, and animal use.

5. Justification:

Substantial information is available on the short-term effects of different reforestation practices on survival and growth of conifers and the development of associated vegetation in coastal forests but very little on the duration of these effects as crowns close and intraspecific competition becomes a prominent factor. Precommercial thinning is also practiced extensively, but its effects on early growth in plantations and the development of associated vegetation has not been quantified. The scheduled duration of two studies in which site preparation treatments were compared side-by-side for a decade on the Siuslaw National Forest is just ending. Large differences are evident due to treatments and to tree protection by tubing.

It is important to learn whether these differences continue as stands close and what effect precommercial thinning has on both stand development and vegetation associated with each treatment. The two studies, totaling 10 replications, are large enough to accommodate a thinning treatment within the framework of the original design. They represent one of the few opportunities to follow the effects of reforestation practices on a longer-term basis where both trees and associated vegetation are monitored to learn the interrelated effects of treatment on both timber and wildlife.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1996

7. Tasks to be Completed by Fiscal Year:

FY 1989	Write study plan for modified continuation of two existing studies. Apply a thinning treatment to the oldest study site, Pitchfork, where trees are starting the 14th year since planting. Obtain baseline tree size data on thinned and unthinned trees at Pitchfork. Make baseline vegetation surveys at Beaver and Upperten.
FY 1990	Apply thinning treatments to two additional study sites, Beaver and Upperten. Obtain baseline tree size data on thinned and unthinned trees at Beaver and Upperten. Make baseline vegetation surveys at Randall and Poposchultz. Make 10-year tree and vegetation measurements on four study sites.
FY 1990 to FY 1995	Continue to measure treatments and periodically analyze data.
FY 1996	Complete data analysis and prepare a manuscript summarizing study results.

8. Publication and Technology Transfer Activities:

Technology transfer from pre-COPE efforts on these studies becomes available in 1989. Updates are possible periodically throughout the extended study period. Several sites represent major opportunities as field demonstration sites. Present study results at workshops as appropriate and prepare articles for the COPE Report.

9. Estimated Costs by Fiscal Year:

FY 89	22,000
FY 90	48,000
FY 91	38,000
FY 92	42,000
FY 93	35,000
FY 94	35,000
FY 95	35,000
FY 96	35,000

April 1988

Study Prospectus
Fundamental COPE

1. Title:

Effects of Time of Manual Cutting on Resprouting of Salmonberry

(This study was initiated in January 1988. Because of the study's relevance to the reforestation of coastal forests and the fact that it is closely coordinated with other COPE research, it is proposed that it become COPE-sponsored research starting in FY 1989.)

2. Principle Investigator and Organization:

John C. Zasada, Research Forester, Pacific Northwest Research Station,
Corvallis, Oregon

(This research is being coordinated with work of John Tappeiner and Bruce Maxwell, OSU, College of Forestry, Corvallis, Oregon; the Waldport and Hebo Ranger Districts, Siuslaw National Forest; and M.A. Radwan, Forestry Sciences Laboratory, Pacific Northwest Research Station, Olympia, Washington.)

3. Applicable COPE Problem:

Regeneration of Coastal Forests

4. Study Objectives:

a. Determine the effect of time of manual treatment on the rate of and spatial distribution of salmonberry resprouting and relate this response to easily observed phenological events.

b. Relate phenology of shoot and leaf development to changes in the concentration of nonstructural carbohydrates in the rhizome system.

c. Determine if salmonberry in burned and unburned clearcuts responds differently to manual treatment.

d. Determine the effect of season on sprouting potential of rhizomes.

5. Justification:

Mechanical treatment of salmonberry is expensive and response to treatment variable. Understanding the response of salmonberry to mechanical treatment at different times in its growth cycle should provide information upon which to improve the effectiveness of the treatment and reduce the cost. Basic physiological data (Barber 1976) and preliminary studies by Roberts (1979, 1980) and the Hebo Ranger District suggest that there are times of the year when salmonberry is more susceptible to manual treatment and that treatment during these periods may be more effective. The basic physiological and morphological information (i.e., stored carbohydrates and sprouting potential of rhizomes) will provide a better understanding of the overall response characteristics of salmonberry regardless of whether the treatment is logging, burning, chemical, manual, or a combination of these.

6. Anticipated Initiation and Completion Date:

January 1, 1988 to September 30, 1990.

7. Tasks to be Completed by Fiscal Year:

FY 1988	Complete a detailed study plan and begin treatments and growth response measurements. Collect rhizomes for carbohydrate analysis and shoot production studies.
FY 1989	Complete treatments carbohydrate analysis of rhizomes. Continue growth response measurements and begin data analysis.
FY 1990	Complete data analysis and prepare a manuscript for publication.

8. Publication and Technology Transfer Activities:

Present results at workshops or other appropriate meetings and conduct visits to study sites. Publish study results and prepare an article for the COPE Report.

9. Estimated Costs by Fiscal Year:

FY 89	25,000
FY 90	20,000

3

April 1988

Study Prospectus
Fundamental COPE

1. Title:

Species manipulation as a strategy to reduce the impact of laminated root rot in regenerated coastal stands

[illegible]

2. Principal Investigators and organizations:

Walter G. Thies, Research Plant Pathologist, Pacific Northwest Research Station, Corvallis, Oregon
Alan Kanaskie, Plant Pathologist, Oregon State Department of Forestry, Salem, Oregon

3. Applicable COPE Problem:

Regeneration of Coastal Forests

4. Study Objectives:

a. Identify the relative susceptibility of coastal Oregon conifers to laminated root rot.

b. Determine if the number of nonsymptomatic-diseased trees in a stand is correlated to the number of symptomatic trees.

c. Measure the minimum inoculum size that can cause seedling mortality.

d. Determine if the size and condition of stumps left on the site can be successfully used to predict seedling mortality due to laminated root rot in the regenerated stand.

5. Justification:

Laminated root rot is responsible for significant losses in the Oregon Coast Range. Using data from recently completed surveys by state and federal agencies we conservatively estimate that there are 300,000 acres of openings in the forests of the Oregon Coast Range caused by laminated root rot, with a nearly equal area populated by infected live trees. This is land out of production but it is also land on which up to $500 per acre is being spent for site preparation and planting which will not result in a harvestable stand. Losses are more severe in northern counties than in southern counties. Using the above survey data, we estimated that Columbia County is experiencing a 50% production short-fall on 32% of the commercial forest land.

Douglas-fir is very susceptible to laminated root rot yet it occupies large areas of commercial forests in the Oregon Coast Range. Use of valuable but more resistant conifers could increase economic yield on infested forest lands, with relatively little additional investment. However, at this time, a verified ranking of commercial conifer species by their susceptibility to laminated root rot is not available. Data on susceptibility to infection and yield of various species on infested sites is an essential prerequisite to recommending reforestation with alternate conifers on traditional Douglas-fir sites.

To develop an ability to predict laminated root rot losses in a replacement stand we need to determine the size of roots that can serve as effective inoculum and the frequency of nonsymptomatic infected trees in an uncut stand.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1994.

7. Proposed Tasks to be Completed By Fiscal Year:

FY 1989	Identify three widely dispersed test stands. Locate and characterize the inoculum in the test stands. Quantify and produce an inoculum map, and identify plots.
FY 1990	Cut the test stands. Do post-cut mapping of infected, standing live trees. Bulldoze infected off-plot stumps and collect and bury inoculum for test of inoculum size vs. effectiveness.
FY 1991	Plant the test plots and protect the seedlings from animals. Collect first growing season seedling survival data.
FY 1992	Replant if significant nondisease seedling losses occur. Collect second growing season seedling survival data.
FY 1993	Collect third growing season seedling survival data.
FY 1994	Complete final data analysis and prepare a manuscript summarizing study results.

8. Publication and Technology Transfer Activities:

Present study results at conferences and workshops as appropriate. Publish research results as they become available. Prepare several articles for the COPE Report.

9. Estimated Cost by Fiscal Year:

FY 89	54,000
FY 90	50,000
FY 91	27,000
FY 92	25,000
FY 93	25,000
FY 94	18,000

Douglas-fir is very susceptible to laminated root rot and is [illegible] areas of commercial forests in the Oregon [illegible]. Use of valuable [illegible] [illegible] a verified ranking of commercial conifer species by their susceptibility to laminated root rot is not available. Data on susceptibility to infection and yield of various species on infested sites is needed prior to recommending reforestation with alternate conifers on traditional Douglas-fir sites.

To develop an ability to predict laminated root rot losses in a replacement stand we need to determine the size of inoculum that represents effective inoculum and the frequency of nonsymptomatic infected trees in an uncut stand.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1994.

7. Proposed Tasks to be Completed By Fiscal Year:

FY 1989	Identify three widely dispersed test stands. Locate and characterize the inoculum in the test stands. Quantify and produce an inoculum map, and identify plots.
FY 1990	Cut the test stands. Do post-cut mapping of infected, standing live trees. Bulldoze infected off-plot stumps and collect and bury inoculum for test of inoculum size vs. effectiveness.
FY 1991	Plant the test plots and protect the seedlings from animals. Collect first growing season seedling survival data.
FY 1992	Replant if significant nondisease seedling losses occur. Collect second growing season seedling survival data.
FY 1993	Collect third growing season seedling survival data.
FY 1994	Complete final data analysis and prepare a manuscript summarizing study results.

4

April 1988

Study Prospectus
Fundamental COPE

not a problem most of W. OR
not thing
to convert non-D-f sites
Anyhow tree growing success
grow alder on alder sites.

1. Title:

Mycorrhizal inoculation of bare-root and container seedlings destined for alder (Alnus rubra) rehabilitation sites in the ~~Oregon Coast~~ Range

2. Principal Investigators and organizations:

Michael Castellano, Research Forester, Pacific Northwest Research Station, Corvallis, Oregon
Ralph Crawford, Plant Pathologist, Pacific Northwest Research Station, Corvallis, Oregon

3. Applicable COPE Problem:

Regeneration of Coastal Forests

4. Study Objectives:

   a. Compare the survival and growth of inoculated and noninoculated container-grown and bareroot Douglas-fir seedlings on various alder rehabilitation sites for at least five years after outplanting.

   b. Compare mycorrhizal fungi for their ability to enhance growth of Douglas-fir seedlings when planted into soil with low mycorrhizal inoculation potential.

5. Justification:

The large stands of pure alder that are common in the Oregon Coast Range are systematically being removed and replaced with Douglas-fir seedlings. Compared with Douglas-fir, alder form mycorrhizae with a vastly different complement of fungi. The soils are rich in nutrients but lacking in diversity of fungi which will form mycorrhizae with Douglas-fir. Douglas-fir seedlings destined for these sites may require selected mycorrhizal fungi to exhibit maximum growth. In some outplanting situations container stock is recommended while in others bareroot stock is. To date there has not been any research on the performance of both types of Douglas-fir inoculated with the same mycorrhizal fungus. Results will aid silviculturists in prescribing the proper type of inoculated stock for alder rehabilitation sites in the Oregon Coastal Range.

6. Anticipated Initiation and Completion Date:

October 1, 1989 to September 30, 1996.

7. Proposed Tasks to be Completed By Fiscal Year:

FY 1989	Select four study sites that are scheduled for removal of alder and planting of Douglas-fir in 1990, preselect four additional study sites destined for planting in 1991. Inoculate container-grown seedlings for outplanting in 1990 and bareroot seedlings for outplanting in 1991.
FY 1990	Assess inoculation success from 1989 inoculations. Plant four study sites with inoculated container stock. Inoculate container stock to be planted in 1991. Collect and summarize data from first four sites.
FY 1991	Assess inoculation success for bareroot and container seedlings. Plant an additional four study sites with both stock types. Collect and summarize data from second four study sites.
FY 1992 through FY 1995	Collect and summarize data from study sites.

8. Publication and Technology Transfer Activities:

Results will be published as they become available. Presentations will be made at meetings and workshops throughout the study, and several articles prepared for the COPE Report.

9. Estimated Cost by Fiscal Year:

FY 89	30,000
FY 90	30,000
FY 91	30,000
FY 92	30,000
FY 93	30,000
FY 94	30,000
FY 95	30,000
FY 96	20,000

230 M

April 1988

Study Prospectus
Fundamental COPE

1. Title:

Asymbiotic nitrogen fixation in large woody residues of Oregon coastal forests

wrong ?, question of need
what buy us after completed

2. Principal investigators and Organizations:

Dr. C.Y. Li, Research Microbiologist, Pacific Northwest Research Station, Corvallis, Oregon
Dr. Randy Molina, Project Leader, Pacific Northwest Research Station, Corvallis, Oregon
Ralph Crawford, Plant Pathologist, Pacific Northwest Research Station, Corvallis, Oregon

3. Applicable Cope Problem:

Regeneration of Coastal Forests

no support
on sci & silv.

4. Study Objectives:

a. To provide baseline information on the amount of nitrogen fixation by free living bacteria in large woody debris before and after tree harvest.

b. To determine the influence of mycorrhizae on nitrogen fixation rates in large woody debris in coastal Oregon forests.

c. To provide information to reforestation specialists on the impact of large woody debris removal on long-term nitrogen economy of Oregon coastal forests.

5. Justification:

Woody residues are conspicuous features of the forest floor in coastal Oregon forests. They provide habitat for plants, animals, and a diversity of microorganisms. Nitrogen fixation by free living (asymbiotic) bacteria in large woody debris is known to input small but significant amounts of nitrogen into Rocky Mountain Douglas-fir forests. Large woody debris also serve as active refugia for roots and mycorrhizae. Recent research by our group has shown a close association between certain mycorrhizae of forest trees and free living nitrogen-fixing bacteria. Information is badly needed on the degree of nitrogen fixation occurring in large woody debris in coastal Oregon forests and the influence of resource management practices (e.g. removal or burning of large woody debris) on long-term accretion of nitrogen via these mechanisms.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1992.

7. Proposed Tasks to be Completed by Fiscal Year:

FY 1989	Select study sites, develop study plan, and determine moisture content of woody residues.
FY 1990	Collect woody residues and measure nitrogen fixation by acetylene reduction.
FY 1991	Determine populations of nitrogen-fixing microorganisms and their associations with mycorrhiaze within the wood.
FY 1992	Analyze data and prepare publications.

8. Publication and Technology Transfer Activities:

Results will be published after the study is completed. Presentations at meetings and workshops will inform forest managers and other interested groups of the role of large woody debris for nitrogen accretion in forest ecosystems. Articles will also be prepared for the COPE Report.

9. Estimated Costs by Fiscal Year:

FY 89	25,000
FY 90	40,000
FY 91	55,000
FY 92	15,000
	135M

LIST OF NEW ADAPTIVE COPE STUDIES
PROPOSED FOR FY 1989

Page

I. Riparian Zone Management

A. Modeling Root Reinforcement in Shallow Forest Soils (Arne Skaugset, and Marv Pyles, OSU) 52

B. The Role and Management of Large Woody Debris for Fish Habitat in Coast Range Streams (Tom McMahon, and Bob Beschta, OSU; Jim Sedell, PNW) 54

C. Establishment of Shade Tolerant Conifers Under Existing Riparian Vegetation (Cathie Bacon, OSU; Ralph Browning, Waldport Ranger District, Siuslaw National Forest) 57

II. Regeneration of Coastal Forests

A. Synthesis of Existing knowledge on Alternative Reforestation Strategies and Treatments with Constraints on Fire and Herbicides (Cathie Bacon, OSU) 59

B. Patterns of Wildlife Abundance and Diversity in Managed Upland Forest Landscapes: An Exploratory Study (Andy Hansen, Bill McComb, Bob Anthony, and Charles Meslow, OSU) 61

April 1988

Study Prospectus
Adaptive COPE

1. Title:

Modeling root reinforcement in shallow forest soils.

2. Principal Investigators and Organizations:

Mr. Arne Skaugset, Hydrologist, Adaptive COPE Team, Oregon State University, Hatfield Marine Science Center, Newport, Oregon
Dr. Marvin Pyles, Associate Professor, Department of Forest Engineering, Oregon State University, Corvallis, Oregon

3. Applicable COPE Problem:

Riparian Zone Management

4. Study Objectives:

a. Develop an analytical model of the root reinforcement mechanism.

b. Determine the relationship between soil strain and rupture for a continuum of simulated root biomasses using a physical model.

c. Verify model results in the field.

5. Justification:

Landslides are the dominant erosional process in the Oregon Coast Range. If excessive sediments become entrained in and/or settle out on streambed gravels, hatching and emergence of salmonid fry may be impaired. More transport resistant sediment can cause stream aggradation which may change the form of and impair the function of the aquatic habitat.

One of the possible causes of accelerated erosion following harvesting is associated with the effect of clearcut silviculture on slope stability. It is hypothesized that the increase in slides is caused, in part, by the decay of harvested tree roots. This hypothesis is based on the concept that the strength of shallow forest soils on steep slopes is due, in part, to reinforcement by roots. When trees are harvested and their roots decay, a reduction in soil strength results. Regeneration of the stand will establish new roots, but a window will exist between harvest and complete regeneration when root reinforcement will be at a minimum. If the reduction in root reinforcement is large enough and if a storm of the sufficient magnitude to cause slides occurs during this window, accelerated erosion caused by increased landsliding may occur.

There are numerous questions remaining concerning the role of roots in stabilizing steep slopes. Research is needed to quantify the extent of root reinforcement in natural and managed forest areas. Slope stability models exist which require data input concerning root strength and at present, there is not an adequate basis for assigning accurate values for this variable. The goal of this research project is to develop a model that will allow the determination of the magnitude of potential root reinforcement. This will allow for the comparison of the magnitude of root reinforcement with other soil strength parameters so a determination can be made of the importance of root reinforcement at a site.

To better manage the steep forested slopes of the Coast Range, land managers will need to have an increasing knowledge of the actual failure mechanism in shallow forest soils. This research will help develop a detailed understanding of the failure mechanism and in particular the mechanism of root reinforcement.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1992

7. Proposed Tasks to be Completed by Fiscal Year:

FY 1989 & 1990	Development of a detailed study plan and an analytical model. Purchase necessary equipment and complete work with the physical model.
FY 1991	Choose a field location for and begin work on the field component of the study.
FY 1992	Finish field verification of the analytical and physical models. Complete data analysis and prepare a manuscript summarizing study results

8. Publication and Technology Transfer Activities:

Research results will be presented at conferences and workshops as appropriate. One or more manuscripts will be prepared regarding study results, and several articles prepared for the COPE Report.

April 1988

Fish only? How about other animals?

Study Prospectus
Adaptive COPE

1. Title:

The Role and Management of Large Woody Debris for Fish Habitat in Coast Range Streams

2. Principal Investigators and Organizations:

Dr. Tom McMahon, Assistant Professor, Adaptive COPE Team, Oregon State University, Hatfield Marine Science Center, Newport, Oregon
Dr. Jim Sedell, Research Ecologist, Pacific Northwest Research Station, Corvallis, Oregon
Dr. Bob Beschta, Professor, Forest Engineering Department, Oregon State University , Corvallis, Oregon

3. Applicable COPE Problem:

Riparian Zone Management

(This study will be closely integrated with the Fundamental COPE Project on Fish Habitat and Riparian Zone Interactions.)

4. Study Objectives:

a. Synthesize current information relative to the abundance, distribution, and composition of large woody debris and fish populations in Oregon Coast Range streams of varying size and management history.

b. Quantify the relationship between quantity and quality of large woody debris and its suitability as habitat for juvenile salmonids.

c. Examine the relationship between large woody debris and fish populations in streams with differing forest management histories (e.g., stand ages, buffer strips).

5. Justification:

Although the importance of large woody debris (LWD) as fish habitat is now well-established, a number of key questions remain as how best to protect and maintain LWD in watersheds managed for timber production or how to manage riparian zones where past practices led to substantial reductions in LWD. These questions are: What is the relationship between amount and quality (species, size, shape, and stability) of debris and fish production? What are the characteristics of debris (distribution, abundance, composition) and associated fish populations in streams flowing through different aged forest stands? What streamside management prescriptions will provide the appropriate types of debris to the stream and in the proper quantities? Answers to these questions are necessary for evaluating the effectiveness of the current Forest Practices Act, for proper placement and design of instream structures to mimic the function of LWD in debris impoverished streams, and for effective management of riparian zones to ensure production of large woody debris over the long-term.

The first step in answering these questions will be to review available published and unpublished information, with particular reference to the Oregon Coast Range. Such an effort will provide managers with a useful synthesis of current information on expected retention times, delivery rates, distribution, size, and composition of LWD in forest streams of various management histories and sizes. This synthesis will focus on ways to adapt this information into management strategies for protecting and enhancing fish habitat. The synthesis would also aid in refining hypotheses to be tested in further field research.

also other species
later with all salmonids

The second study objective (b) will quantify the relationship between the quantity and quality of LWD and its suitability as fish habitat. Initial field research will be aimed at testing Forward's method for rating the suitability of individual debris jams (the 'complexity index') as habitat for juvenile coho salmon. Preliminary testing in British Columbia demonstrated the potential merit of this rating method, but further research is needed to test the relationship between this index and utilization by coho salmon, particularly during the winter when coho are more strongly dependent on LWD for cover. Combining a method for measuring the 'quality' of LWD with methods for measuring the amount of LWD along a stream (e.g., number of pieces or volume) will provide fishery and forestry managers with the quantitative information needed to evaluate and manage LWD and fish habitat on a watershed basis.

The third study objective (c) will measure the characteristics of riparian vegetation, LWD, channel morphology, and fish populations in streams with differing forest management histories. Large woody debris, channel morphology and fish populations in the three streams studied under the former Alsea Watershed Project will be examined. These streams provide a unique opportunity to compare the characteristics of fish, fish habitat, and riparian vegetation in streams with differing and well-documented management histories (no timber harvesting, patch cut with buffer strips and clearcut with no buffer strips) 22 years after logging.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1992

7. Proposed Tasks to be Completed by Fiscal Year:

FY 1989	Complete a detailed study plan and prepare a draft manuscript which synthesizes current information.
	Identify study sites and begin to test the relationship between the quantity and quality of LWD and its suitability as fish habitat (objective b).
FY 1990	Complete field sampling and begin data analysis (objective b).
	Identify study sites in the Alsea Watershed and begin field sampling to examine the relationship between LWD and fish populations in streams with differing forest management histories (objective c).
FY 1991	Complete final data analysis and prepare a draft publication relative to objective b.
	Complete field sampling in the Alsea Watershed and begin data analysis relative to objective c.
FY 1992	Complete data analysis and prepare a draft manuscript for publication.

8. Publication and Technology Transfer Activities:

Prepare and publish a report which synthesizes existing information. Prepare manuscripts for publication which report the results of objectives b and c. Present study results at conferences and workshops as appropriate and prepare several articles for the COPE Report.

3

April 1988

Study Prospectus
Adaptive COPE

1. Title:

Establishment of Shade Tolerant Conifers Under Existing Riparian Vegetation

2. Principal Investigators and Organizations:

Dr. Catherine Bacon, Adaptive COPE Team, Oregon State University, Hatfield Marine Science Center, Newport, Oregon
Ralph Browning, Fisheries Biologist, Waldport Ranger District, Siuslaw National Forest

3. Applicable COPE Problem:

Riparian Zone Management

4. Study Objectives:

a. Determine if shade tolerant native conifers can become established in existing alder and/or salmonberry stands normally found in riparian zones.

b. Determine which reforestation practices result in best growt of under- or interplanted conifer seedlings.

5. Justification:

The current forest Practices Act contains regulations designed to enhance fish habitat, including the recruitment of large, coniferous, woody debris. However, due to natural and man-caused disturbances many riparian areas are dominated by stands of alder and salmonberry. There are few conifers within these stands and little possibility of natural conifer regeneration. If planted conifers can be established in riparian leave areas they may become future crop trees and a source of large woody debris in streams.

Several aspects of conifer establishment in riparian areas are unknown. Emmingham and others (in prep.) have shown that planted hemlock seedlings can survive and grow under upland alder stands, and that growth was enhanced by thinning of the overstory alder. Thus in this study different planting strategies will be explored, such as planting under gaps in the hardwood or brush canopies. Different methods of competing vegetation control, may benefit seedlings and can be tested.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30 1994

7. Proposed Tasks to be Completed by Fiscal Year:

FY 1989	Write a detailed study plan and participate in a preliminary test of planting redcedar in cooperation with Ralph Browning.
other species, hemlock, grand fir	Select and plant study sites and take initial measurements.
FY 1990 through FY 1993	Monitor plots and take end of season measurements.
FY 1994	Complete final data analysis and prepare a draft manuscript for publication summarizing study results.

8. Publication and Technology Transfer Activities:

Present study results as they become available at appropriate conferences and workshops. Prepare manuscripts for publication and articles for the COPE Report.

4

April 1988

Study Prospectus
Adaptive COPE

1. Title:

Synthesis of Existing Knowledge on Alternative Reforestation Strategies and Treatments with Constraints on Fire and Herbicides

2. Principal Investigators and Organizations:

Dr. Catherine Bacon, Silviculturist, Adaptive COPE Team, Oregon State University, Hatfield Marine Science Center, Newport, Oregon

3. Applicable COPE Problem:

Regeneration of Coastal Forests

4. Study Objectives:

a. Synthesize current information on vegetation management and reforestation strategies and treatments, with constraints on fire and herbicides, that are applicable to the Oregon Coast Range.

b. From this synthesis, develop a study prospectus to test a specific hypothesis on the use of alternative vegetation management or reforestation techniques.

5. Justification:

Unwanted woody and herbaceous vegetation rapidly invades and often dominates sites after harvesting. This is particularly true on the productive sites of the Oregon Coast Range where competition from vegetation can limit the growth and survival of conifers. Removal of competition can be accomplished using several different tools, however, managers face increasing restrictions on the use of traditional vegetation management methods (i.e., slash burning and herbicides). Consequently, alternative techniques are necessary for the reduction of competing vegetation in young conifer plantations.

In the last few years, many managers have experimented with alternative vegetation management treatments. However, information on the effectiveness of these treatments, has not been synthesized for the Oregon Coast Range and results have not been shared among user groups. A synthesis of the current published and unpublished work would be valuable for both the dissemination of results and for the identification of areas for additional study.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1990

7. Proposed Tasks to be Completed by Fiscal Year:

FY 1989	Complete a draft synthesis manuscript and prepare a FY 90 study prospectus for actual field research based on results of the synthesis.
FY 1990	Submit the synthesis manuscript for publication.

8. Publication and Technology Transfer Activities:

Present the results of this work at conferences and workshops as appropriate. Publish the synthesis manuscript and prepare an article for the COPE Report.

5

April 1988

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Study Prospectus
Adaptive COPE

1. Title:

Patterns of wildlife abundance and diversity in managed upland forest landscapes: An exploratory study

2. Principal Investigators and Organizations:

Dr. Andrew J. Hansen, Assistant Professor, Adaptive COPE Team, Oregon State University, Hatfield Marine Science Center, Newport, Oregon

Dr. William C. McComb, Associate Professor, Department of Forest Science/ Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon

Dr. Robert G. Anthony, Assistant Leader, Oregon Cooperative Wildlife Research Unit/Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon

Dr. E. Charles Meslow, Leader, Oregon Cooperative Wildlife Research Unit/ Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon

3. Applicable COPE Problem:

Regeneration of Coastal Forests

4. Study Objectives:

a. Determine patterns of wildlife abundance and community structure across an upland forest landscape that includes managed and natural stand types.

b. Quantify habitat characteristics over the landscape in terms of vegetation (stand composition, structure, age, size, juxtaposition, management history, length of edge) and geography (slope position, topography, aspect, landslide history, distance to water).

c. Perform correlation analyses to evaluate associations among wildlife and habitat patterns.

5. Justification:

There is currently little known about wildlife habitat associations in the managed forest lands in the Oregon Coast Range. Existing studies from the Pacific Northwest and elsewhere suggest several habitat characteristics that may influence wildlife diversity and abundance in the Coast Range. Some of these factors are: seral stage of vegetation; stand size; stand patchiness; length of edge; topography; distance to water; and disturbance history. Rigorous study of all these factors is logistically and economically unfeasible. Consequently, this exploratory study is designed to identify the habitat characteristics that are most likely to be important to wildlife in the Oregon Coast Range. These habitat factors will then be examined in more detail in follow-up investigations.

This work will be done over an upland managed forest landscape of approximately 1500-2000 acres that includes several stand types and topographic settings. Wildlife surveys and habitat analyses across this landscape should reveal the wildlife habitat associations that most merit detailed study. This investigation is a good starting point for COPE wildlife research in uplands because it will reveal new information on wildlife habitat associations in managed Coast Range forests and provide direction for future COPE research.

6. Anticipated Initiation and Completion Date:

October 1, 1988 to September 30, 1990

7. Proposed Tasks to be Completed by Fiscal Year:

FY 1989	Complete a detailed study plan.
	Select a study area and establish transects for wildlife censuses.
	Complete wildlife sampling and habitat analyses.
	Initiate correlational analyses of wildlife and habitat data.
FY 1990	Complete data analyses and prepare a draft publication summarizing study results.

8. Publication and Technology Transfer Activities:

Research results will be presented at conferences and workshops as appropriate. One or more manuscripts summarizing final study results will be prepared for publication and an article submitted to the COPE Report.

April 1988

Fundamental COPE

Combined OSU and PNW Budget Summary
FY 88 and FY 89

Projected Expenditures

	FY 88 (anticipated)	FY 89 (requested)
OSU[a]	$429,140	$ 524,176
PNW	$373,860	729,824
Total	$803,000	$1,254,000

Revenues

	FY 88 (appropriation)	FY 89 (planned)[b]
USDA, FS	$323,178	$ 626,127
USDI, BLM	$479,822	627,873
Total	$803,000	$1,254,000

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[a] Includes funds necessary for program administration.

[b] Amounts for FY 89 are tentative pending final action by Congress and the Administration.

April 1988

Adaptive COPE

Budget Summary
FY 88 and FY 89

Expenditures	FY 88 (anticipated)		FY 89 (requested)
Personnel (salaries, wages, and OPE)	$177,000		$315,000
Services and Supplies	20,000		25,000
Travel	42,000		40,000
Indirect Costs (overhead)	12,000		19,000
Capital Costs (equipment, facilities)	25,000		15,000
Tuition Remission	0		0
Total	**$276,000**		**$414,000**
Biennial Total		$690,000	

full staff now onboard

Revenues	89	FY 88 (anticipated) ok		FY 89 (planned)[a]
BLM District	70	$ 70,000		$
National Forests	70	70,000		
Industry	105	105,000		
State Forests ??		20,000		
Dept. Forestry			10,000	
Div. State Lands			10,000	
Counties	35	31,600		
Other		25,350		
Dept. Energy			5,000	
Dept. Fish & Wildlife	5		5,000	
Dept. Land Conservation			5,000	
Oregon Coastal Zone Mgt. Assn. ~ ?			0	
Oregon Small Woodland Assn.	5		350	
U.S. Fish & Wildlife			5,000	
Bureau of Indian Affairs - ?			5,000	
Carryover		38,500		
Total		**$360,450**		**$**

406 M
434 M
range

includes 84M canyons could be ~~[illegible]~~M 8M

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[a] Appropriate amounts to be determined at the May 10 COPE Advisory Council Meeting.

MADE IN CANADA